WHAT IS CLAIMED IS:

1. A video signal processing apparatus to process an input video signal for displaying an image based on the video signal comprising:

a detector to detect a gradation level of the input video signal; and

a processor to depress a color saturation level of the input video signal in a predetermined color saturation level range only when the detected gradation level is located in a predetermined gradation level range.

2. The apparatus according to claim 1, wherein the detector includes a generator to generate a control signal when the detected gradation level is located in the predetermined gradation level range, a level of the control signal varying according to the detected gradation level, the processor depressing the color saturation level of the input video signal in response to the control signal.

3. The apparatus according to claim 2, wherein the smaller the detected gradation level in the predetermined gradation level range from the level zero to a first predetermined gradation level, the larger the level of the control signal, the larger the detected gradation level in the predetermined gradation level range from the first predetermined gradation level to a second predetermined gradation level that is larger than the first gradation level, the larger the level of the control signal, and the smaller the detected gradation level in the predetermined gradation level range from the second predetermined gradation level to a third predetermined gradation level that is larger than the second gradation level, the larger the level of the control signal.

4. The apparatus according to claim 2, wherein the processor includes:

a generator to generate a color saturation depression amount according to the level of the control signal; and

a subtractor to subtract the color saturation depression amount from the input video to depress the color saturation level of the input video signal according to the level of the control signal.

5. The apparatus according to claim 4, wherein the larger the level of the control signal from the level zero to a predetermined control signal level, the larger the color saturation depression amount, while larger the level of the control signal from the predetermined control signal level to a predetermined maximum control signal level, the smaller the color saturation depression amount.

6. An apparatus for converting a first input video signal having a first gradation level into a second video signal having a second gradation level that is lower than first gradation level, for displaying an image based on the input video signal comprising:

a generator to generate error data in response to a data portion of the first input video signal, the data portion corresponding to a difference between the first and the second gradation levels, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, at least one of the error diffusion coefficients for one of the R-, G- and B-signal components being different from the other error diffusion coefficients for the other signal components; and

an adder to add the generated error data to the first input video signal, thus converting the first input video signal into the second video signal.

7. The apparatus according to claim 6, wherein the generator generates a predetermined number of error data for multiplying a data portion of an input video signal that has been input by a predetermined period ago by the error diffusion coefficients according to the predetermined number of the surrounding pixel

dots, the adder adding the predetermined number of error data to the present input video signal.

8. An apparatus for converting a first input video signal having a first number of bits into a second video signal having a second number of bits that is smaller than first number of bits, for displaying an image based on the input video signal comprising:

a generator to generate error data in response at least to a data portion of lower significant bits of the first number of bits of the first input video signal, the lower significant bits corresponding to a difference between the first and the second number of bits, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, at least one of the number of bits of the error diffusion coefficients for one of the R-, G- and B-signal components being different from the other number of bits of the error diffusion coefficients for the other signal components; and

an adder to add the generated error data to the first input video signal, thus converting the first input video signal into the second video signal.

9. The apparatus according to claim 8, wherein the error diffusion coefficients are different from each other when the number of bits of the error diffusion coefficients is the same each other.

10. A method of displaying an image based on an input video signal, the method comprising the steps of:

applying reverse-gamma correction to an input first video signal;

converting the reverse-gamma correction-applied input first video signal having a first gradation level into a second video signal having a second gradation level that is lower than first gradation level by multi-gradation processing; and

switching the signal conversion between a first state in which the input first video signal requires multi-gradation processing and a second state in which the input first video signal does not require multi-gradation processing.

11. A method of displaying an image based on an input video signal, the method comprising the steps of:

applying reverse-gamma correction to an input first video signal;

converting the reverse-gamma correction-applied input first video signal having a first number of bits into a second video signal having a second number of bits that is smaller than first number of bits by multi-gradation processing; and

switching the signal conversion between a first state in which the input first video signal requires multi-gradation processing and a second state in which the input first video signal does not require multi-gradation processing.

12. The method according to claim 11 wherein the reverse-gamma correction is provided with first reverse-gamma correction characteristics that allows the conversion processing, and the second reverse-gamma correction characteristics that does not allow the conversion processing, the switch switching the first processor between the first and the second reverse-gamma correction characteristics.

13. The method according to claim 11 wherein the reverse-gamma correction is provided with first reverse-gamma correction characteristics that allows the conversion processing, and the second reverse-gamma correction characteristics that does not allow the conversion processing, the switch switching the reverse-gamma correction between the first and the second reverse-gamma correction characteristics.

14. The method according to claim 12 wherein each of the first and the second characteristics exhibits a relationship between input gradation level and output gradation level, and the output

gradation for the second characteristics more varies than that for the first characteristics with respect to the input gradation.

15. The method according to claim 13 wherein each of the first and the second characteristics exhibits a relationship between input gradation level and output gradation level, and the output gradation for the second characteristics more varies than that for the first characteristics with respect to the input gradation.

16. The method according to claim 11 wherein the signal conversion step includes the step of converting lower significant bits of the reverse-gamma correction-applied input first video signal into zero before the signal conversion, the lower significant bits corresponding to a difference between the first and the second video signals, to switch the signal conversion into the second state.

17. A method of displaying an image based on an input video signal, the method comprising the steps of:

applying reverse-gamma correction to an input first video signal;

generating error data in response at least to a data portion of lower significant bits of the first number of bits of the first input video signal, the lower significant bits corresponding to a difference between the first and the second number of bits, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, the generated error data being added to the first input video signal, thus converting the first input video signal into the second video signal; and

setting the generated error data at zero to halt the signal conversion.

18. A method of displaying an image based on an input video signal, the method comprising the steps of:

applying reverse-gamma correction to an input first video signal having a first number of bits, the reverse-gamma correction being provided at least with first reverse-gamma correction characteristics and second reverse-gamma correction characteristics different from the first characteristics;

converting the reverse-gamma correction-applied first input video signal into a second video signal having a second number of bits smaller than the first number of bits, by generating error data in response at least to a data portion of lower significant bits of the first number of bits of the first input video signal, the lower significant bits corresponding to a difference between the first and the second number of bits, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, the generated error data being added to the first input video signal;

turning on or off the conversion of the first input video signal to the second video signal;

switching the reverse-gamma correction between the first and the second reverse-gamma correction characteristics with respect to a first state in which the input first video signal requires the input video signal conversion and a second state in which the input first video signal does not require the input video signal conversion; and

setting all the lower significant bits of the first input video signal at zero to turn off the signal conversion to achieve the second state.

19. A method of displaying an image based on an input video signal, the method comprising the steps of:

applying reverse-gamma correction to an input first video signal having a first number of bits, the reverse-gamma correction being provided at least with first reverse-gamma

correction characteristics and second reverse-gamma correction characteristics different from the first characteristics;

converting the reverse-gamma correction-applied first input video signal into a second video signal having a second number of bits smaller than the first number of bits, by generating error data in response at least to a data portion of lower significant bits of the first number of bits of the first input video signal, the lower significant bits corresponding to a difference between the first and the second number of bits, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, the generated error data being added to the first input video signal;

turning on or off the conversion of the first input video signal to the second video signal;

switching the reverse-gamma correction between the first and the second reverse-gamma correction characteristics with respect to a first state in which the input first video signal requires multi-gradation processing and a second state in which the input first video signal does not require multi-gradation processing; and

setting all the generated error data at zero to turn off the signal conversion to achieve the second state.

20. An apparatus of displaying an image based on an input video signal comprising a reverse-gamma corrector to apply reverse-gamma correction to the input video signal, the reverse-gamma corrector being provided with at least first and second reverse-gamma correction characteristics each representing a relationship between an input gradation level and an output gradation level, the first characteristics being composed of a first straight line having a first gradient from an input gradation level zero to a predetermined input gradation level, the second characteristics being composed of a second straight line having a second gradient from the input gradation

level zero to the predetermined input gradation level, the first and the second gradient being different from each other, each straight line being followed by a curve at the predetermined input gradation level.

21. An apparatus of displaying an image based on an input video signal comprising:

a first processor to apply reverse-gamma correction to an input first video signal having a first number of bits, the reverse-gamma corrector being provided with at least first and second reverse-gamma correction characteristics each representing a relationship between an input gradation level and an output gradation level, the first characteristics being composed of a first straight line having a first gradient from an input gradation level zero to a predetermined input gradation level, the second characteristics being composed of a second straight line having a second gradient from the input gradation level zero to the predetermined input gradation level, the first and the second gradient being different from each other, each straight line being followed by a curve at the predetermined input gradation level;

a second processor having at least a first and a second generator to convert the first input video signal into a second video signal having a second number of bits smaller than the first number of bits, each generator generating error data in response at least to a data portion of lower significant bits of the first number of bits of the first input video signal, the lower significant bits corresponding to a difference between the first and the second number of bits, the number of the lower significant bits being different from each other between the first and the second generators, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, the generated error data being added to the first input video signal; and

a switch to switch the first processor between the first

and the second reverse-gamma correction characteristics, thus generating a switching signal, in response to the switching signal, the second processor being switched between the first and the second generators with respect to the different number of bits of the lower significant bits.

22. An apparatus of displaying an image based on an input video signal comprising:

a first processor to apply reverse-gamma correction to an input first video signal having a first number of bits, the reverse-gamma corrector having reverse-gamma correction characteristics representing a relationship between an input gradation level and an output gradation level, the characteristics being composed of a straight line having a gradient 1/t ($t \geqq 1$) from an input gradation level zero to a predetermined input gradation level, the straight line being followed by a curve at the predetermined input gradation level; and

a second processor to convert the first input video signal into a second video signal having a second number of bits smaller than the first number of bits, by generating error data in response at least to a data portion of lower significant bits "n" ($t = 2^n$) of the first number of bits of the first input video signal, if "n" including decimal places, the decimal places being rounded down, the lower significant bits corresponding to a difference between the first and the second number of bits, the error data being obtained by multiplying the data portion by predetermined error diffusion coefficients according to pixel dots that surround a pixel dot composed of R(red)-, G(green)- and B(blue)-signal components of the first input video signal, the generated error data being added to the first input video signal.